

Patent Claims:

1. A press-on apparatus for locking together two gear members (1, 2, 3) running together and transmitting a torque having means for registering a relevant parameter, more specifically for registering the torque to be transmitted, and having means for applying a press-on force corresponding to the registered parameter, *characterized in that* said press-on apparatus includes at least two press-on apparatus parts (9, 10, 11; 14), the first one of the two press-on apparatus parts requiring a shorter reaction time than the second one of the two press-on apparatus parts.
2. The press-on apparatus as set forth in claim 1, *characterized in that* the first press-on apparatus part (9, 10, 11) is unregulated.
3. The press-on apparatus as set forth in claim 1 or 2, *characterized in that* the second press-on apparatus part (14) is regulated.
4. A press-on apparatus for locking together two gear members (1, 2, 3) running together and transmitting a torque having means for registering a relevant parameter, more specifically for registering the torque to be transmitted, and having means for applying a press-on force corresponding to the registered parameter, *characterized in that* said press-on apparatus includes at least two press-on apparatus parts (9, 10, 11; 14) and that the first press-on apparatus part (9, 10, 11) provides a press-on force that is greater than or equal to the press-on force to be provided by said press-on apparatus and the second press-on apparatus part (14) reduces the press-on force provided by the first press-on apparatus part (9, 10, 11).
5. The press-on apparatus as set forth in any one of the claims 1 through 4, *characterized in that* the second press-on apparatus part (14) applies a pressure opposing the force applied by the first press-on apparatus part (9, 10, 11).

6. The press-on apparatus as set forth in any one of the claims 1 through 5, *characterized in that* the second press-on apparatus part (14) partially accommodates the force applied by the first press-on apparatus part (9, 10, 11).
- 5 7. A gear with two torque transmitting gear members (1, 2, 3) that are locked together by a press-on apparatus as set forth in any one of the claims 1 through 6.
8. The gear as set forth in claim 7, *characterized in that* the second press-on apparatus part (14) is hydraulically actuated.
- 10 9. The gear as set forth in claim 8, *characterized in that* the hydraulic actuation includes an electromagnetically actuated piston (48).
10. The gear as set forth in claim 9, *characterized in that* the piston closes an
15 overflow/refill port (52) on its pressure generating path.
11. The gear as set forth in claim 8, *characterized in that* the hydraulic actuation comprises a gear pump (61).
- 20 12. The gear as set forth in claim 11, *characterized in that* the gear pump is actuated by an electric motor (62) that applies a voltage dependent torque.
13. The gear as set forth in any one of the claims 7 through 12 with at least two operating conditions in which at least one input member (101) and at least one output member
25 (102) are pressed against each other by means of at least one press-on apparatus exerting a press-on pressure varying as a function of the respective operating condition, *characterized in that* the press-on apparatus (108; 125, 126) includes at least two press-on units (110, 111; 125, 126).
- 30 14. The gear as set forth in any one of the claims 7 through 13, *characterized in that* the two press-on units (110, 111; 125, 126) comprise different operating condition – press-on force characteristic curves.

15. The gear as set forth in any one of the claims 7 through 14, *characterized in that* the two press-on units (110, 111; 125, 126) have a first share in the press-on force in the first operating condition and a second share in the press-on force in the second operating condition, with the difference between the first and the second share of the first press-on unit differing from the difference between the first and second share of the second press-on unit.
16. The gear as set forth in any one of the claims 7 through 15, *characterized in that* the two press-on units are configured to act in parallel with respect to determining the operating condition and/or with respect to the press-on force.
17. The gear as set forth in any one of the claims 7 through 16, *characterized in that* the two press-on units (110, 111; 125, 126) are configured to act in series with respect to determining the operating condition and/or with respect to the press-on force.
18. The gear as set forth in any one of the claims 7 through 17, *characterized in that* at least one press-on unit (110, 111; 125, 126) comprises an operating condition – press-on force characteristic curve having a substantially constant slope.
19. The gear as set forth in any one of the claims 7 through 18, *characterized in that* the press-on apparatus (108; 125, 126) includes at least two press-on units (110, 111; 125, 126) coupled together.
20. The gear as set forth in claim 19, *characterized in that* the coupling is configured to be mechanical.
21. The gear as set forth in claim 19 or 20, *characterized in that* the coupling is configured to be hydrodynamic or hydrostatic.

22. The gear as set forth in any one of the claims 7 through 21, *characterized in that* a press-on unit (126) is disposed on the input side and a press-on unit (125) on the output side.
- 5 23. The gear as set forth in any one of the claims 7 through 22 with at least two operating conditions in which at least one input member (101) and at least one output member (102) are pressed against each other by means of at least one press-on apparatus (108; 125, 126) exerting a press-on pressure varying as a function of the respective operating condition, *characterized in that* said press-on apparatus comprises an operating
10 condition – press-on force characteristic curve that has another average slope between an at rest position of the friction gear and a first operating condition than between the first operating condition and a second operating condition.
24. A method of operating a friction gear with at least one input member (101) and at least
15 one output member (102) that are pressed against each other by means of a press-on apparatus (108; 125, 126), *characterized in that* said press-on apparatus (108; 125, 126) is operated with an operating condition – press-on force characteristic curve that has another average slope between an at rest position of the friction gear and a first operating condition than between the first operating condition and a second operating
20 condition.
25. The method or friction gear as set forth in any one of the claims 7 through 24, *characterized in that* the operating condition is chosen to be proportional to the output and/or input torque.
- 25 26. The method or friction gear as set forth in any one of the claims 7 through 25, *characterized in that* the first operating condition is the lowest torque anticipated to occur under full load.
- 30 27. The method or friction gear as set forth in any one of the claims 7 through 26, *characterized in that* the first operating condition is the highest torque anticipated to occur under full load.

28. The method or friction gear as set forth in any one of the claims 7 through 27,
characterized by at least two press-on units (125, 126) the press-on force of a
respective one of which is varied by different kinds of operating conditions such as
input torque, output torque, total load, forces or the like.
29. The method or friction gear as set forth in any one of the claims 7 through 28,
characterized in that the press-on apparatus (108; 125, 126) comprises a torque –
press-on force characteristic curve that effects a press-on force of near 0 N, more
specifically of less than 1 N, at insignificant torque.
30. The method or friction gear as set forth in any one of the claims 7 through 29,
characterized in that the press-on apparatus (108; 125, 126) comprises a torque –
press-on force characteristic curve that comprises, between a lowest torque anticipated
to occur in operation and a highest torque anticipated to occur in operation, a smaller
average slope under full load than below the lowest torque anticipated to occur in
operation.
31. The method or friction gear as set forth in any one of the claims 7 through 30,
characterized in that the press-on apparatus (125, 126) comprises a load dependent
operating condition – press-on force characteristic curve.
32. The method or friction gear as set forth in claim 31, *characterized in that* the press-on
force under loads below full load is smaller than the press-on force under full load.